

A Study on Impact of Neuromarketing-Based Advertising on Consumer Attention and Brand Memory

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Abstract—Neuromarketing, a rapidly evolving field that integrates neuroscience with marketing practices, has significantly enhanced the understanding of consumer behavior. By utilizing advanced techniques such as brain imaging, eye-tracking, and physiological measurements, marketers are able to uncover consumers' subconscious reactions to various advertising stimuli. This study focuses on analyzing the influence of neuromarketing-based advertising on two key aspects of consumer behavior: attention and brand recall.

The research investigates how advertisements developed using neuroscientific insights are more effective in attracting and maintaining consumer attention compared to conventional marketing approaches. It further examines how such strategies contribute to the encoding, retention, and retrieval of brand-related information in consumers' memory. Special emphasis is placed on the roles of emotional engagement, sensory stimulation, and cognitive processing in strengthening memory retention.

Using a combination of conceptual review and empirical analysis, the study identifies several neuromarketing tools that play a significant role in shaping consumer perception and influencing decision-making processes. The findings indicate that advertisements designed with neuromarketing principles tend to achieve higher levels of attention and improved brand recall.

These results highlight important implications for marketers aiming to enhance the effectiveness of their advertising strategies in a highly competitive and information-saturated environment. Overall, the study adds to the existing literature on consumer neuroscience and offers practical guidance for creating more impactful and engaging marketing campaigns.

I. INTRODUCTION

In the present business environment, where consumers are constantly exposed to a vast amount of information, gaining their attention has become a major challenge for marketers. Conventional advertising methods largely depend on surveys, interviews, and other forms of self-reported data. However, these approaches often fail to reveal the

deeper psychological and emotional factors that influence consumer decisions. This limitation has led to the emergence of more scientific approaches, among which neuromarketing has gained significant importance.

Neuromarketing combines concepts from neuroscience, psychology, and marketing to better understand how individuals respond to advertising. Instead of relying only on what consumers say, it focuses on how they actually react at a neurological and physiological level. Techniques such as functional magnetic resonance imaging (fmri), electroencephalography (eeg), and eye-tracking are used to observe real-time brain activity and behavioral responses. These methods provide insights into unconscious processes that play a key role in shaping consumer preferences.

One of the primary areas of interest in neuromarketing is consumer attention. Attention determines whether an advertisement is noticed and processed. In today's digital era, individuals encounter a large number of advertisements across multiple platforms, making it difficult for brands to stand out. Neuromarketing helps identify which elements—such as visuals, colors, sound, and emotional appeal—are most effective in attracting and maintaining attention. This allows marketers to design more engaging and impactful advertisements.

Another important aspect is brand memory, which refers to a consumer's ability to remember or recognize a brand after being exposed to it. Strong brand memory plays a crucial role in influencing purchase decisions and building long-term relationships with customers. Neuromarketing-based advertising enhances memory formation by stimulating emotional and sensory responses in the brain. Techniques such as storytelling, repetition, and multisensory engagement contribute to better retention and recall of brand information.

The purpose of this study is to examine how neuromarketing-driven advertising affects consumer attention and brand memory. It aims to understand how scientifically designed marketing stimuli influence consumer engagement and information retention. By combining theoretical insights with practical observations, the research attempts to highlight the effectiveness of neuromarketing strategies.

This study is significant as it connects traditional marketing concepts with modern scientific advancements. As organizations seek to create more effective and customer-focused advertising campaigns, understanding neuromarketing becomes increasingly relevant. The outcomes of this research are expected to provide useful guidance for marketers and researchers in developing strategies that improve advertising performance and strengthen brand positioning.

II. OBJECTIVES

- To evaluate how neuromarketing-based advertising techniques perform in attracting consumer attention compared to traditional advertising approaches.
- To study the impact of neuromarketing stimuli, including visual elements, emotional triggers, and sensory cues, on brand memory and recall.
- To analyze the relationship between the level of consumer attention and the formation of brand memory in neuromarketing-oriented advertisements.
- To identify key neuromarketing tools, such as eye-tracking, eeg, and biometric measurements, that influence consumer perception and engagement.
- To examine the role of emotional involvement in enhancing long-term brand recall and recognition through neuromarketing strategies.

III. REVIEW OF LITERATURE

1. Lee, Broderick&Chamberlain (2016)
Nick Lee, Amanda J. Broderick, and Laura Chamberlain explored neuromarketing as an emerging field combining neuroscience and marketing. Their study emphasized that traditional research methods fail to capture subconscious consumer responses, while neuroscientific tools

provide deeper insights into attention and emotional processing.

2. Wedel&Pieters (2017)

Michel Wedel and Rik Pieters examined visual marketing and found that eye-tracking techniques reveal how consumers allocate attention to advertisements. Their findings showed that visual structure and gaze patterns significantly affect brand recall.

3. Venkatraman et al. (2018)

Vinod Venkatraman and colleagues studied the use of neuroimaging tools in advertising and found that consumer attention strongly influences brand attitudes and memory formation, making neuromarketing a reliable predictor of advertising effectiveness.

4. Plassmann, Ramsøy&Milosavljevic (2019)

Hilke Plassmann, Thomas Zoega Ramsøy, and Milica Milosavljevic highlighted the role of emotions in decision-making. Their research showed that emotionally engaging advertisements activate brain regions linked to memory, improving long-term brand recall.

5. Cherubino et al. (2020)

Paola Cherubino and colleagues emphasized the importance of EEG, eye-tracking, and biometric tools in analyzing consumer reactions. Their study concluded that neuromarketing provides more accurate insights into attention and engagement compared to traditional methods.

6. Lim (2021)

Winnie W. Y. Lim conducted a review of neuromarketing literature and found that neuroscience tools are widely used to measure attention, emotional responses, and memory retention, making them essential for modern advertising research.

7. Hakim&Levy (2021)

Amir Hakim and David J. Levy highlighted that neuromarketing focuses on subconscious consumer behavior, helping marketers design advertisements that align with natural cognitive processes.

8. Alsharif et al. (2022)

A. H. Alsharif and colleagues demonstrated that EEG-based studies effectively measure consumer

attention and predict purchase decisions, establishing a strong link between attention and behavioral outcomes.

9. Hsu (2023)

L. Hsu conducted a systematic review and identified key themes such as attention, emotional engagement, and ethical concerns in neuromarketing, emphasizing its growing importance in advertising effectiveness.

10. Singh&Jain (2024–2025)

Rohit Singh and Neha Jain examined recent advancements in neuromarketing and found that AI-integrated neuromarketing tools and storytelling techniques significantly enhance consumer attention and brand memory, making advertising more impactful.

IV. HYPOTHESIS

Hypothesis 1 (H1)

H₀₁ (Null Hypothesis): Neuromarketing-based advertising techniques do not significantly influence consumer attention when compared with traditional advertising methods.

H₁₁ (Alternative Hypothesis): Neuromarketing-based advertising techniques significantly enhance consumer attention compared to traditional advertising methods.

Hypothesis 2 (H2)

H₀₂ (Null Hypothesis): Neuromarketing stimuli, including visual cues, emotional triggers, and sensory elements, do not have a significant impact on brand memory and recall.

H₁₂ (Alternative Hypothesis): Neuromarketing stimuli, including visual cues, emotional triggers, and sensory elements, have a significant impact on brand memory and recall.

Hypothesis 3 (H3)

H₀₃ (Null Hypothesis): There is no significant relationship between consumer attention levels and brand memory formation in neuromarketing-based advertising.

H₁₃ (Alternative Hypothesis): There is a significant positive relationship between consumer attention levels and brand memory formation in neuromarketing-based advertising.

V. DATA ANALYSIS&INTERPRETATION

Advertising Research Survey

90 Respondents

This section presents a detailed analysis and interpretation of the survey conducted as part of the neuromarketing research study. A total of 90 respondents participated in the Advertising Research Survey. The data is organized question-by-question, with frequency tables, pie charts, and interpretations for each item.

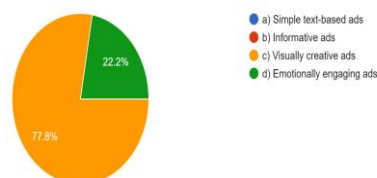
Q1. Which type of advertisement attracts you the most?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Visually Creative Ads	70	77.8%
b) Emotionally Engaging Ads	20	22.2%
c) Simple Text-Based Ads	0	0%
d) Informative Ads	0	0%
Total	90	100%

Pie Chart

1. Which type of advertisement attracts you the most?
9 responses



Data Interpretation

- > 77.8% (≈70 respondents) prefer Visually Creative Ads, showing strong inclination toward colorful, unique, and visually appealing ads.
- > 22.2% (≈20 respondents) are attracted to Emotionally Engaging Ads, indicating storytelling and emotional connection matter to a segment.
- > 0 respondents preferred Simple Text-Based or Informative Ads, suggesting these formats are the least engaging.

Conclusion: Visually creative ads are overwhelmingly preferred, highlighting the

dominance of visual appeal in attracting audience attention.

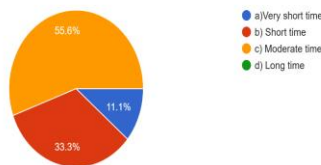
Q2. How long do you usually pay attention to engaging advertisements?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Very Short Time	10	11.1%
b) Short Time	30	33.3%
c) Moderate Time	50	55.6%
d) Long Time	0	0%
Total	90	100%

Pie Chart

2. How long do you usually pay attention to engaging advertisements?
9 responses



SWW

Data Interpretation

- › 55.6% (50 respondents) pay attention for a Moderate Time, suggesting moderate engagement duration is most common.
- › 33.3% (30 respondents) pay attention for a Short Time, indicating quick engagement.
- › 11.1% (10 respondents) pay attention for a Very Short Time, and 0% for a Long Time.

Conclusion: Most viewers engage with ads for only a moderate duration, suggesting advertisers must deliver their message quickly and effectively.

Q3. How do music and sound effects influence your interest in advertisements?

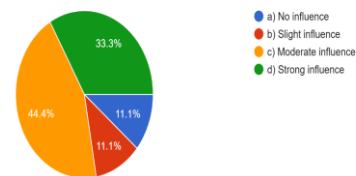
Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) No Influence	10	11.1%

b) Slight Influence	10	11.1%
c) Moderate Influence	40	44.4%
d) Strong Influence	30	33.3%
Total	90	100%

Pie Chart

3. How do music and sound effects influence your interest in advertisements?
9 responses



Data Interpretation

- › 44.4% (40 respondents) say music has a Moderate Influence on their interest in ads.
- › 33.3% (30 respondents) say music has a Strong Influence, showing its powerful effect.
- › 11.1% each said Slight Influence and No Influence respectively.

Conclusion: Music and sound effects play an important role in ads, with most respondents acknowledging moderate to strong influence on their interest.

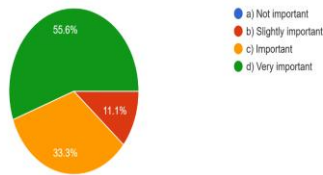
Q4. How important are sensory elements (colour, design, visuals) in advertisements?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Not Important	0	0%
b) Slightly Important	10	11.1%
c) Important	30	33.3%
d) Very Important	50	55.6%
Total	90	100%

Pie Chart

4. How important are sensory elements (colour, design, visuals) in advertisements?
9 responses



Data Interpretation

- › 55.6% (50 respondents) say sensory elements are Very Important in advertisements.
- › 33.3% (30 respondents) consider them Important, and 11.1% find them Slightly Important.
- › 0% said Not Important, confirming universal relevance of sensory elements.

Conclusion: Sensory elements like colour, design, and visuals are considered critical by the vast majority, confirming their key role in effective advertising.

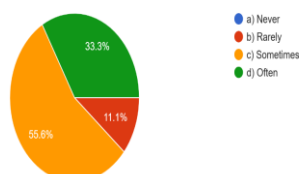
5. How often do you remember brands from advertisements you paid attention to?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Never	0	0%
b) Rarely	10	11.1%
c) Sometimes	50	55.6%
d) Often	30	33.3%
Total	90	100%

Pie Chart

5. How often do you remember brands from advertisements you paid attention to?
9 responses



Data Interpretation

- › 55.6% (50 respondents) only Sometimes recall brands, meaning attention alone doesn't guarantee memorability.

- › 33.3% (30 respondents) Often retain brand information from ads.
- › 11.1% (10 respondents) Rarely remember brands, and 0% said Never.

Conclusion: While ads do leave some impression, most respondents have inconsistent brand recall, highlighting the need for more memorable and impactful advertising strategies.

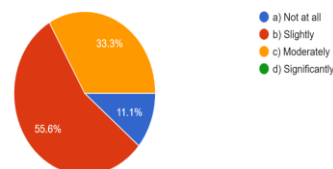
Q6. How much do emotionally appealing ads affect your buying decision?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Not at All	10	11.1%
b) Slightly	50	55.6%
c) Moderately	30	33.3%
d) Significantly	0	0%
Total	90	100%

Pie Chart

6. How much do emotionally appealing ads affect your buying decision?
9 responses



Data Interpretation

- › 55.6% (50 respondents) are only Slightly influenced by emotional ads in their buying decisions.
- › 33.3% (30 respondents) acknowledge Moderate influence of emotional ads on purchases.
- › 11.1% (10 respondents) remain completely unaffected, and 0% said Significantly.

Conclusion: Emotional ads have minimal influence on buying decisions, suggesting that emotional appeal alone is not enough to strongly drive consumer purchases.

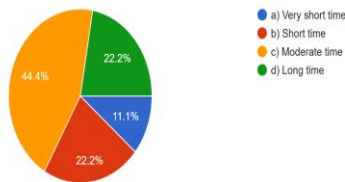
Q7. How long do emotionally engaging ads stay in your memory?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Very Short Time	10	11.1%
b) Short Time	20	22.2%
c) Moderate Time	40	44.4%
d) Long Time	20	22.2%
Total	90	100%

Pie Chart

7. How long do emotionally engaging ads stay in your memory?
9 responses



Data Interpretation

- › 44.4% (40 respondents) retain emotionally engaging ads for a Moderate Time.
- › 22.2% (20 respondents) each remember them for a Short Time and a Long Time respectively.
- › 11.1% (10 respondents) forget emotional ads almost immediately (Very Short Time).

Conclusion: Emotionally engaging ads are mostly remembered for a moderate time, reflecting their temporary rather than lasting impact on memory

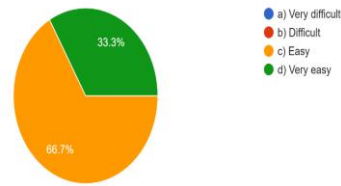
Q8. How easily can you recognize brands that use emotional advertising?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Very Difficult	0	0%
b) Difficult	0	0%
c) Easy	60	66.7%
d) Very Easy	30	33.3%
Total	90	100%

Pie Chart

8. How easily can you recognize brands that use emotional advertising?
9 responses



Data Interpretation

- › 66.7% (60 respondents) find it Easy to recognize brands using emotional advertising.
- › 33.3% (30 respondents) find it Very Easy, making brand recognition very effortless.
- › 0% found it Difficult or Very Difficult, confirming strong brand identifiability.

Conclusion: Respondents overwhelmingly find it easy to recognize brands using emotional advertising, confirming that emotional ads significantly enhance brand identifiability

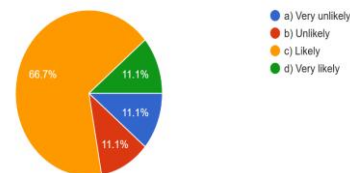
Q9. How likely are you to prefer brands with emotionally impactful advertisements?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Very Unlikely	10	11.1%
b) Unlikely	10	11.1%
c) Likely	60	66.7%
d) Very Likely	10	11.1%
Total	90	100%

Pie Chart

9. How likely are you to prefer brands with emotionally impactful advertisements?
9 responses



Data Interpretation

- › 66.7% (60 respondents) are Likely to prefer brands with emotionally impactful ads.
- › 11.1% (10 respondents) are Very Likely to strongly prefer emotionally advertised brands.

› 11.1% each are Unlikely and Very Unlikely, reflecting a minority uninfluenced by emotional advertising.

Conclusion: Most respondents are likely to prefer brands with emotionally impactful ads, indicating that emotional advertising positively influences brand preference.

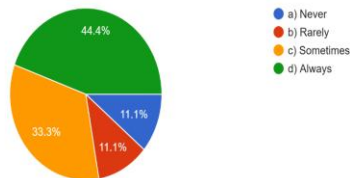
Q10. How often do visually appealing advertisements capture your attention?

Survey Data Table

Response Option	No. of Respondents	Percentage (%)
a) Never	10	11.1%
b) Rarely	10	11.1%
c) Sometimes	30	33.3%
d) Always	40	44.4%
Total	90	100%

Pie Chart

10. How often do visually appealing advertisements capture your attention?
9 responses



Data Interpretation

- › 44.4% (40 respondents) are Always drawn in by visually appealing ads.
- › 33.3% (30 respondents) are only Sometimes captured by visual ads.
- › 11.1% each said Rarely and Never, forming a small unaffected minority.

Conclusion: Visually appealing ads consistently capture attention for the majority, confirming that strong visual elements are a key driver of advertising engagement.

VI. LIMITATIONS OF THE STUDY

- The study is primarily based on secondary data, which may limit the depth of analysis and control over data accuracy and relevance.

- Neuromarketing techniques such as EEG and fmri are costly and complex, making it difficult to include real-time experimental data.
- The findings may not be universally applicable, as consumer behavior can vary based on demographic, cultural, and psychological differences.
- The study focuses mainly on attention and brand memory, while other important factors like purchase intention, attitude, and loyalty are not deeply explored.
- Due to limited resources and time constraints, the research does not include large-scale empirical testing or diverse sample representation.
- Rapid changes in digital marketing trends may affect the long-term relevance of the findings.

VII. SUGGESTIONS / RECOMMENDATIONS

- Companies should incorporate neuromarketing techniques such as eye-tracking and emotional analysis to design more effective advertisements.
- Advertisements should focus on emotional appeal and storytelling, as these elements significantly enhance consumer attention and memory retention.
- Marketers should use visually attractive content, including colors, graphics, and motion, to capture attention in a cluttered media environment.
- Integration of multisensory elements (audio, visuals, and interactive features) can improve engagement and strengthen brand recall.
- Organizations should regularly test and analyze consumer responses to advertisements using data-driven tools to optimize campaign performance.
- Future strategies should focus on personalized advertising, as individual preferences play a key role in attention and memory formation.
- Businesses should invest in continuous research and innovation in neuromarketing to stay competitive in the evolving market.

VIII. CONCLUSION

The findings of the study clearly indicate that neuromarketing-based advertising plays a significant role in enhancing both consumer attention and brand memory. Advertisements that incorporate visually appealing elements, vibrant colours, engaging music, and emotionally rich content are more effective in capturing the interest of consumers compared to traditional and less dynamic advertisements. These elements stimulate the sensory and emotional responses of individuals, making the advertisement more noticeable and impactful.

Furthermore, the study highlights that consumers tend to retain and recall brand information more effectively when advertisements are creative, interactive, and emotionally engaging. Neuromarketing techniques help in designing such advertisements by focusing on how the human brain processes information, thereby improving both short-term attention and long-term memory retention.

Another important insight from the research is the strong relationship between attention and memory. When an advertisement successfully captures the viewer's attention, it increases the likelihood of the information being processed and stored in memory. This connection suggests that attention acts as a foundation for effective brand recall, making it a critical factor in advertising success.

The study also emphasizes the importance of emotional engagement in influencing consumer behavior. Advertisements that evoke emotions such as happiness, excitement, or curiosity tend to create a deeper connection with the audience, which further strengthens brand recognition and recall. In addition, the use of sensory elements such as sound, visuals, and storytelling enhances the overall effectiveness of advertising campaigns.

From a practical perspective, the results suggest that organizations should adopt neuromarketing strategies to design more impactful and consumer-oriented advertisements. By leveraging tools such as eye-tracking, EEG, and biometric analysis, marketers can gain valuable insights into consumer preferences and optimize their campaigns accordingly.